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# *Carex kagoshimensis*, a New Species of *Carex* (sect. *Rhomboidales*) from Japan

TAKAHIRO SHIMIZU

*3-2-1 Uozaki-nakamachi, Higashinada-ku, Kobe 658-0083, Japan*

*Carex kagoshimensis* Tak. Shimizu is described as new to science. It is similar to *C. laticeps* in the shape of the achenes, but differs by having emarginate scales in the staminate inflorescence, plants (except utricle) glabrous, wider leaves (2 to 3 times wider), and utricles ascending and sparsely pubescent. It faintly resembles *C. insaniae* var. *papillaticulmis* in the shape of the utricles, but differs by having deep notches on the ridges of the achenes and a strongly curved beak lacking an annular appendage, the emarginate scales of the staminate flowers, numerous utricles (at least 3 times as many) on the lowest spike and smooth bract sheaths. *Carex kagoshimensis* occurs in Yamaguchi, Miyazaki and Kagoshima prefectures.

Key words: *Carex insaniae* var. *papillaticulmis*, *Carex kagoshimensis*, *Carex laticeps*, new species

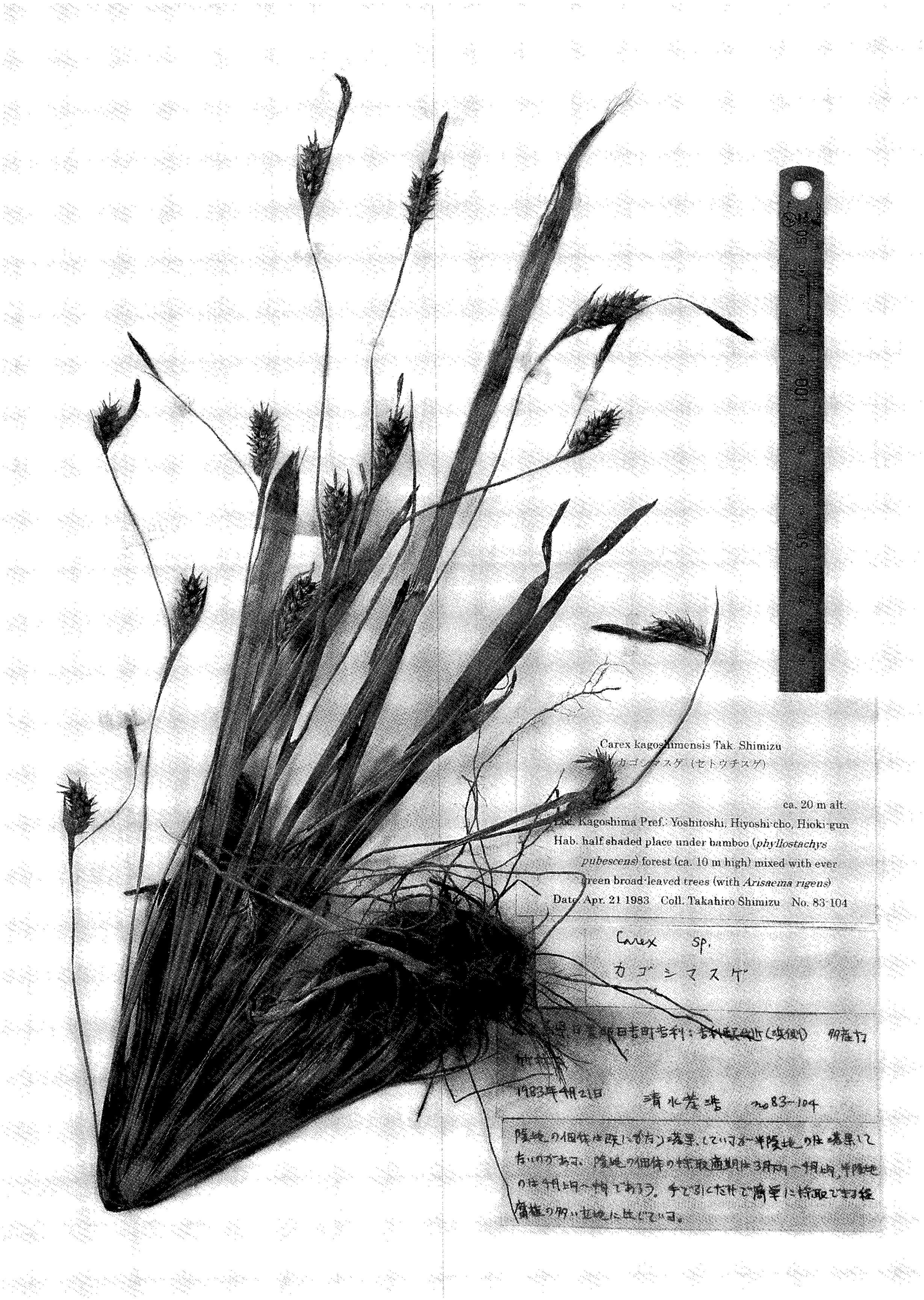
Oka *et al.* (1972) reported an unknown sedge from Murotsu, Yamaguchi Pref., and noted that it was similar to *Carex insaniae* Koidz. var. *subdita* (Ohwi) Ohwi. In 1981 and 1983, I found the same sedge referred to by Oka *et al.* (1972) at Yoshitoshi, Kagoshima Pref. Based on the specimens *Tak. Shimizu 83-104* (KAG) from Yoshitoshi, Hatushima (1986) reported this sedge as "*Carex* sp. nov." and mentioned its resemblance to *C. insaniae* var. *papillaticulmis* (Ohwi) Ohwi. Katsuyama (2005) wrote that the sedge from Murotsu is identical to the one from Yoshitoshi and similar to *Carex laticeps* C. B. Clarke ex Franch., but differing from *C. laticeps* in the hairiness of the whole plant (except the utricle) (glabrous in *C. kagoshimensis*) and leaf width (10 mm in *C. kagoshimensis*; 3-5 mm in *C. laticeps*). According to Shimizu (2006), the sedge is more similar to *C. laticeps* than to *C. insaniae* var. *papillaticulmis* because of the strong similarity in the shape of the achenes, although they differ in many other morphological characters. Here I describe this sedge as a new species.

**Carex** (sect. *Rhomboidales*) **kagoshimensis** Tak. Shimizu, **sp. nov.** (Figs. 1, 2A-D & 3)

Affinis *Carici laticepti* C. B. Clarke ex Franch., sed herba glabra, foliis 6.5-18.5mm latis, squamis masculis emarginatis, utriculis ascendentibus et parce pubescentibus differt.

*Typus*. JAPAN, Kyushu, Kagoshima Pref.: Yoshitoshi, Hiyoshi-cho, Hioki-shi, ca. 20 m alt., Apr. 21, 1983, *Tak. Shimizu 83-104* (holo- KYO; iso- KAG, KANA, KPM, OKAY, OSA, RYU, SHO, TI, TNS, TUS).

Herbs, perennial, evergreen. *Rhizomes* ligneous, thickened at nodes, densely covered with dark brown fibers. *Culms* 37-85 cm tall, 0.8-1.8 mm thick, papillate, rounded or obtusely trigonous, somewhat hollow. Basal sheaths pale or light brown, lusterless,



Carex kagoshimensis Tak. Shimizu
カゴシマスゲ（セトウチスゲ）

ca. 20 m alt.
Loc. Kagoshima Pref.: Yoshitoshi, Hiyoshi-cho, Hioki-gun
Hab. half shaded place under bamboo (*phyllostachys pubescens*) forest (ca. 10 m high) mixed with ever green broad-leaved trees (with *Arisaema rigens*)
Date Apr. 21 1983 Coll. Takahiro Shimizu No. 83-104

Carex sp.
カゴシマスゲ

[illegible]県日置郡日吉町吉利：吉利駅付近（東側） 孟宗竹
竹林内
1983年4月21日 清水孝浩 No.83-104

陰地の個体は既にかなり結果していますが半陰地のは結果していないのがある。陰地の個体の採取適期は3月下旬～4月上旬、半陰地のは4月上旬～中旬であろう。手で引くだけで簡単に採取できる程腐植の多い土地に生じている。

FIG. 1. Holotype of *Carex kagoshimensis*.

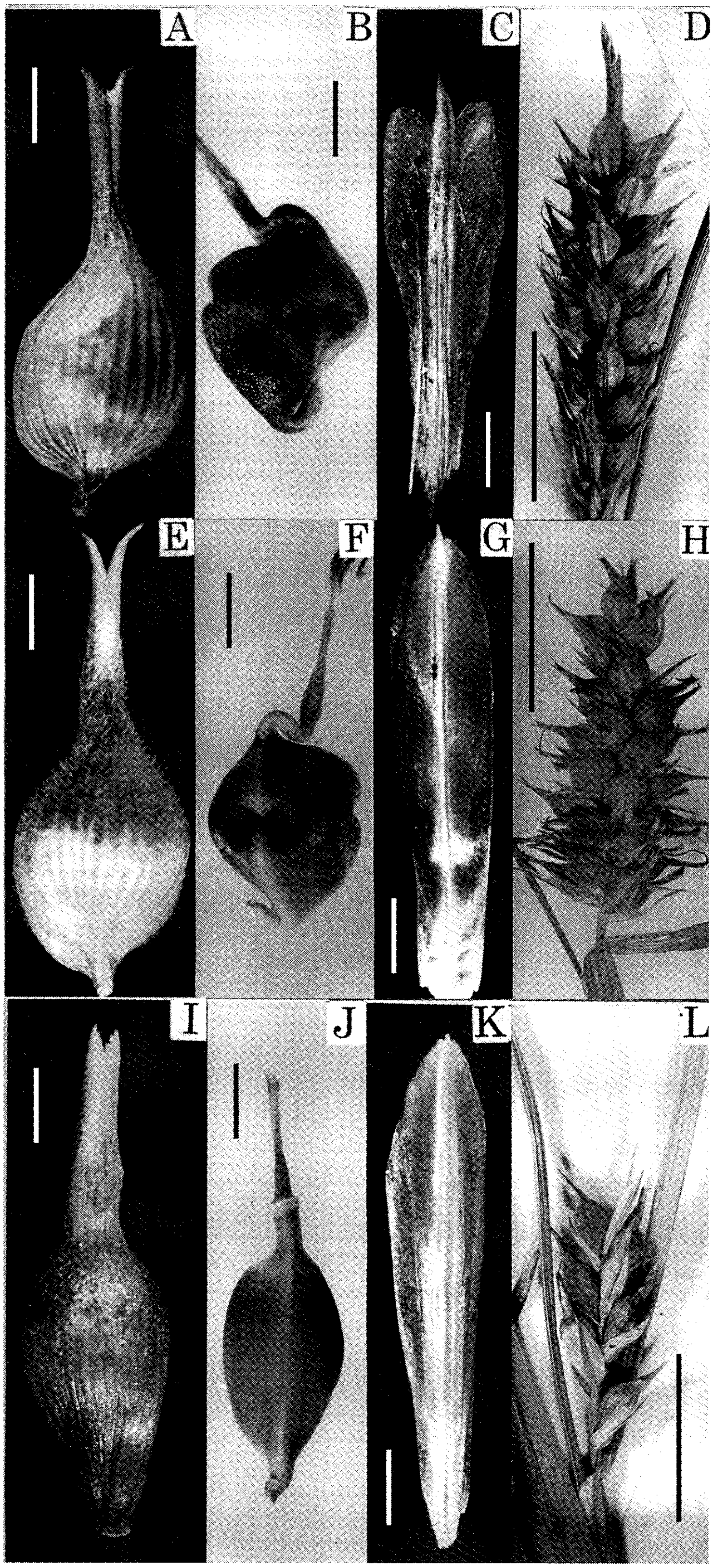


FIG. 2. Dorsal view of utricles (A, E & I. Bar = 1 mm), achenes (B, F & J. Bar = 1 mm), staminate scales (C, G & K. Bar = 1 mm) and lowest spikes (D, H & L. Bar = 1 cm) of *Carex kagoshimensis* (A–D: Yoshitoshi, Pref. Kagoshima, *Tak. Shimizu 83-104*); *C. laticeps* (E–H: Satoshyo-cho, Pref. Okayama, *Tak. Shimizu 07-31*); and *C. insaniae* var. *papillaticulmis* (I–L: Mt. Kasagata, Pref. Hyogo, *Tak. Shimizu 83-242*).

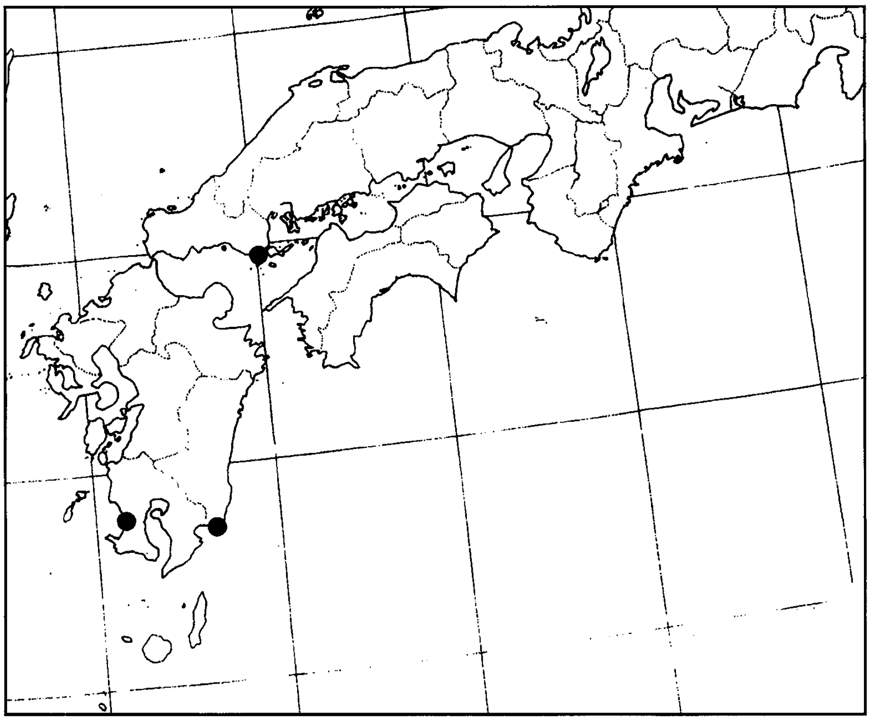


FIG. 3. Distribution of *Carex kagoshimensis*.

later splitting into brown fibers. *Leaves* linear to broadly linear, 35–55 cm long, 6.5–18.5 mm wide, dark green or light brownish green, smooth. *Spikes* 2–4; terminal spike staminate, sometimes with a pistillate flower at lowest part, linear, 0.8–4.2 cm long, 1.3–4 mm thick, reddish brown; peduncles 0.1–11 cm long; lateral spikes pistillate (usually with distal staminate flowers), densely flowered, remote, oblong-cylindrical to narrowly oblong-cylindrical, 1.7–4.8 cm long, 8–10 mm thick; peduncles 0–0.5(–20) mm long; lowest spikes bearing 33–57 utricles, sometimes nearly radical. Lowest bracts 2.5–14 cm long; sheaths long and smooth; blade leaf-like, 3–7 mm wide. *Staminate scales* narrowly obovate or narrowly elliptic, emarginate, shortly aristate (0.6–0.8 mm long), 5–6.5 mm long, light reddish brown. *Pistillate scales* narrowly elliptic or narrowly ovate, acute or somewhat emarginate, shortly aristate (1–2 mm long) or not, 4–5 mm long (except arista), with central dark green zone. *Utricles* longer than scales, broadly ovoid or broadly ellipsoid, sparsely pubescent, indistinctly trigonous, 5.3–7.4 mm long, with 30–35 distinct nerves, base shortly stipitate; beak elongate, deeply bifid (2.2–3.3 mm long). *Achenes* broadly rhombic or broadly obovoid, obtusely trigonous, with a deep cleft at middle of ridges, 2.3–2.7mm long excluding the beak and the stipe; stipe strongly curved; beak strongly curved. *Stigmas* 3.

*Japanese name*. Setouchi-Suge (Oka *et al.* 1972), Kagoshima-Suge (Hatusima 1986)

*Habitat*. In or at edges of evergreen broad-leaved or mixed forests with *Phyllostachys pubescens*; near the sea coast.

*Carex kagoshimensis* is similar to *C. laticeps* in the shape of achenes, the deep groove in the middle of all three ridges, and the strongly curved beak lacking an annular appendage at apex (Fig. 2B & F). *Carex kagoshimensis* differs from *C. laticeps* in that the whole plant, except the utricle, is glabrous in the former and pilose in the latter, the leaves are broader in the former (6.5–18.5 mm versus 3–6 mm) in the latter, the staminate scales are emarginate in the former (Fig. 2C) and acuminate to rounded in the latter (Fig. 2G), and the utricles are ascending

TABLE 1. Comparison of morphological characters between *Carex kagoshimensis* and its allies.

| | *C. kagoshimensis* | *C. laticeps* | *C. insaniae* var. *papillaticulmis* |
|---|---|---|---|
| Hairiness(except utricle) | glabrous | pilose | glabrous |
| Leaf width (mm) | 6.5-18.5 | 3-6 | 4-9 |
| Sheath of bract | smooth | smooth | scabrous |
| Shape of staminate scale | emarginate | acuminate to rounded | acuminate to rounded |
| Utricle | | | |
| angle (when ripe) | ascending | patent | ascending |
| number (at lowest spike) | 33-57 | 19-40 | 3-17 |
| hairiness | sparsely pubescent | densely pubescent | sparsely pubescent |
| Achene | | | |
| ridges of achene | deeply cleft | deeply cleft | slightly cleft or not |
| apex of beak | without annular appendage | without annular appendage | with an annular appendage |
| base of beak | strongly curved | strongly curved | straight or slightly curved |

and sparsely pubescent in the former (Fig. 2A & D), but patent and densely pubescent in the latter (Fig. 2E & H)(Table 1).

*Carex kagoshimensis* is also similar to *C. insaniae* var. *papillaticulmis* in its rather large utricle with a long bifid beak (Fig. 2A & I), but it differs from *C. insaniae* var. *papillaticulmis* in that the sheath of the bracts is smooth in the former and scabrous in the latter, the staminate scales are emarginate in the former (Fig. 2C), but acuminate to rounded in the latter (Fig. 2K), there are 33-57 utricles in the lowest spike in the former (Fig. 2D) and 3-17 in the latter (Fig. 2L), the achenes are deeply grooved in the middle of all three ridges in the former (Fig. 2B) while not grooved in the latter (Fig. 2J), and the beak of the achenes are strongly curved and without an annular appendage in the former (Fig. 2B), but straight or slightly curved and with an annular appendage in the latter (Fig. 2J) (Table 1).

Oka *et al.* (1972) mentioned a resemblance between *C. kagoshimensis* and *C. insaniae* var. *subdita*, but they differ in the shape of staminate scales (emarginate in the former, acuminate to rounded in the latter), leaf width (6.5-18.5 mm in the former, 2-5 mm in the latter), number of utricles on the lowest spike (33-57 in the former, 3-11 in the latter) and bract sheaths (smooth in the former, scabrous in the latter).

*Other specimens examined.* JAPAN. **Honshu.** Yamaguchi Pref.: Murotsu, Kumage-gun, Kaminoseki-cho: 12 May 1969, *K. Oka 33058* (Yamaguchi Prefectural Mus.); 12 May 1969, *F Naruhashi 2186* (KYO); 23 May 1988, *Tak. Shimizu 88-395* (KYO, OKAY, SHO); 7 May 2001, *Tak. Shimizu 01-103* (KYO); *Tak. Shimizu 01-104* (KYO, SHO). **Kyushu.** Miyazaki Pref.: Toi, Hiuga (Kushima-shi, Toi), 1 Apr. 1924, S. *Saito s.n.* (TI). — Kagoshima Pref.: Yoshitoshi, Hiyoshi-cho, Hioki-shi: 16 May 1981, *Tak. Shimizu 81-348* (KYO); 14 May 1989, *S. Hatusima 44265* (KAG); 8 Apr. 2003, *T. Katsuyama NAO123381* (KPM); *T. Katsuyama NAO123382* (KPM); 17 Apr 2005, *Tak. Shimizu 05-5* (KYO, SHO); 7 Apr. 2006, *Tak. Shimizu 06-9* (KYO); *Tak. Shimizu 06-12* (KYO, OKAY); *Tak. Shimizu 06-13* (KYO); *Tak. Shimizu 06-14* (KYO, OKAY); 22 Apr. 2006, *Hoshino et al. 20589* (OKAY); 27 Jul. 2006, *Tak. Shimizu 06-188* (KYO); 24 Apr. 2007, *Tak. Shimizu 07-2* (KYO).

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## References

Hatushima, S. 1986. Kagoshima-Ken Shokubutu

Mokuroku (rev. ed.). Kagoshima Shokubutu Dokokai, Kagoshima. (in Japanese)

Katsuyama, T. 2005. *Carex* of Japan. Bun-ichi Sogo Shuppan, Tokyo. (in Japanese)

Oka, K., H. Masaki, K. Katsumoto, N. Miake & S. Miyake (eds.) 1972. Flora of Yamaguchi Prefecture. Yamaguchi-Ken Shokubutushi Kankokai, Yamaguchi. (in Japanese)

Shimizu, T. 2006. Comparison between *Carex* sp. "Kagoshima-Suge (Setouchi-Suge)" and its allies. J. Jap. Cyperol. 12: 79-86. (in Japanese)

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